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Review Article

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# Ethanomedicinal properties of Euphorbiaceae family- A comprehensive review

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## Abstract

Family Euphorbiaceae is one the largest families of angiosperms, composed of over 300 genera and 8,000 species, with all types of plants ranging from large woody trees through climbing lianas to simple weeds that grow prostrate to the ground. The members of the family are cosmopolitan in distribution constituting both old and new world plants. Euphorbiaceae family consisting of large varieties of vegetative forms some of which are of great ethanomedicinal importance. In this review, an attempt has been made to provide data base on ethanomedicinal properties of 90 members of Euphorbiaceae family, it includes botanical name, local name, plant parts used for treatment and their reported activity. This study has revealed that Euphorbiaceae members act as an effective remedy for many diseases like antidiaheria, antioxidants, antibacterial, antiameobic, anticancer, antiplasmodial, HIV/AIDS, jaundice, infertility, neurosis, syphilis, small pox, asthama, hypoglycemic, diabetes and inflammation etc.,

**Keywords:** Euphorbiaceae, Ethanomedicine, diseases

## Introduction

The plants that possess therapeutic properties or exert beneficial pharmacological effects on the animal body are generally designated as “Medicinal plants”. Ethanomedicine is the study of belief and practices concerning illness in different human population. It is a system of medicine practiced by people without the knowledge of literature but is effective in the health problem of respective communities. Ethanomedicine, a part of ethanobotany deals with the study of ethnic beliefs, concepts, knowledge and practices in the midst of the tribal for controlling or curing diseases [1]. The tribal’s are familiar about the medicinal uses of plants found in their village’s surroundings and forests areas. However, their young generation is not interested to hold this valuable traditional knowledge transmitted orally from generation to generation. Therefore before this traditional knowledge is lost it must be documented properly [2]. Pioneering research on indigenous medicinal plants was initiated by Sir Ram Nath Chopra, which is well documented in his comprehensive treatise [3].

The Euphorbiaceae is the one of the largest families of dicotyledons, and also has significant economic importance. The family has a cosmopolitan distribution with five subfamilies, 49 tribes, 317 genera and about 8,000 species. The family Euphorbiaceae is generally distinguished by the milky sap (when present), the unisexual flower, ovary superior and generally trilocular, placentation axile, ovules collateral, pendulous with ventral raphe and usually carunculate. Euphorbiaceae is considered as one of the top 25 economically important plant family (B.C Beneth) [4].

Historically, medicinal plants have provided a source for novel drug compounds and medicines derived from plants has made large contributions to health needs of many societies.

Drugs of herbal origin have been used in traditional systems of medicine such as Unani and Ayurveda since ancient times [5]. The use of the medicinal herbs for curing disease has been documented in history of all civilizations. Medicinal plants are of great importance to the health of individuals and communities. Herbal medicines are also cheap, easily available and affordable. Medicinal plants are the local heritage with global importance. The chemical compounds present in herbal products are a part of the physiological functions of living organisms, and hence they are believed to have better compatibility with the human body.

Medicinal plants are resources of new drugs. Cultivation and preservation of medicinal plants protect biological diversity. The therapeutic properties of medicinal plant are because of secondary metabolites i.e. phytochemicals such as tannins, alkaloids, steroids, glycosides, flavanoid, anthrocyanin etc. Herbal medicine is the most ancient form of health care known to humankind. The treatment and control of diseases by the use of available medicinal plants in a locality will continue to play significant roles in medical health care implementation in the developing countries [WHO, 2002]. There is therefore the need to look inwards to search for herbal medicinal plants with the aim of validating the ethanomedicinal use and subsequently the isolation and characterization of compounds which will be added to the potential lists of drugs.

Ethanomedicine of Euphorbieaceae is very diverse. According to Seigler 1994 [171] this diversity is due to the presence of a wide variety of unusual secondary metabolites. Further, the family comprises many plants possess poisonous substance that is Ricin which is protein found in Ricinus communis (Palatnick and Tenenbein, 2000) [172]. Other species such as Jatropha Curcas L. (Mampane et.al. 1987) [173], Euphorbia scheffleri Pax, Euphorbia *tirucalli* L., *Euphorbia inaequilatera* Sond, *Euphorbia ledienii* A Berger, *Euhorbia heterophylla* L., *Euphorbia cooperi* N.E.Br. ex A. Berger, *Euphorbia candelabrum* Kotschy, *Euphorbia venenifica* Tremaux ex Kotschy *Euphorbia caput-medusae* L., *Euphorbia silenifolia* (Haworth) Sweet, *Euphorbia ingens* E. Mey. Ex Boiss; *E. tirucalli*, *Euphorbia poissonii, Euphorbia unispina* and *E. venenifica* (Abdel-Fattah 1987) [174] also posses poisonous compounds.

In addition, some members are said to cause or influence susceptibility to certain body ailments. For example *E. tirucalli, Euphorbia leuconeura*, *J. curcas* and others are known to be cocarcinogenic and can influence/promote excessive cell division resulting in tumour growth (Hirota and Suttajit, 1988 [175]; Van Damme, 2001 [176]; Vogg et al., 1999) [177]. Also latex of *E. tirucalli* and *Euphorbia royleana* is known to cause conjunctivitis on contact with eyes (Shlamovitz et al.,2009 [179]; Van Damme, 1989 [176]

On other side, Hooper (2002) [179] reports the use of *Euphorbia polycarpa*, *Euphorbia hirta*, and *Acalypha indica* L. for treatment of different ailments in the ancient Ayurveda system. In ancient Chinese medicine, Lai et al. (2004) [180] reports 33 species belonging to 17 genera of Euphorbiaceae used in herbal medicine. The www.botanical.com. website lists a number of Euphorbiaceae with varying curative features including: *Euphorbia. peplus* L., *Euphorbia. peploides*, *Euphorbia pilosa*, *Euphorbia palustris* being remedies for hydrophobia; *Euphorbia peplus, Euphorbia helioscopia*, *Euphorbia humistrata*, *Euphorbia hypericifolia, Euphorbia portulacoides* L., *Euphorbia iata* Engelm, *Euphorbia marginata* Pursh, *Euphorbia drummondii* and *Euphorbia heterodoxa* for general home ailments.

Some of the Euphorbiaceae plant extracts are registered drugs and as such available on the market. Examples include Euphorbium (resiniferatoxin), from latex of *Euphorbia resinifera* (Appendino and Szallasi, 1997)181 marketed as 'Complexe Lehning Euphorbium N 88' and used as a nasal spray or compositum against viral infections, rhinitis of various origins, sinusitis, chronic nasal discharge, dry and inflamed nasal membranes as well as flu symptoms. *Euphorbia pilulifera* (the asthma weed) extract has been cited in Steadman's drugs list and can be applied against asthma, coryza and other respiratory infections and as an anti-spasmodic (www.drugs.com)182.

The present paper highlights the ethanomedicinal properties of total 90 herbal medicinal plants belonging to Euphorbiaceae family. Table 1 gives a comprehensive overview of the reported medicinal activity of important medicinal plants

**Table 1- Medicinal Properties of total 90 Euphorbiaceae plants.**

| Sr. No. | Botanical name | Plant part used | Vernacular name | Reported activity | Reference |
|---|---|---|---|---|---|
| 1. | Clutia abyssinica Jaub. & Spach | Roots, leaves Decoction | Large or Smooth-fruited lightning-bush | Venereal and skin diseases, chest problems, cancer, fertility in both humans | [5-6] |
| 2. | *Phyllanthus reticulates (Kirganelia reticulate)* | fruit | Leafflower(English) Panjulids(Hindi) | Used as astringent to the bowels and is used in inflammation | [7] |
| 3. | *Phyllanthus reticulates (Kirganelia reticulate)* | leaves | Leafflower(English) Panjuli(Hindi) | Diuretic and cooling medicine, diarrhea in infants, sores, burns, suppurations and chafing of the skin. | [7] |
| 4. | *Phyllanthus reticulates (Kirganelia reticulate)* | stems | Leafflower(English)Panjuli (Hindi) | Used to treat sore in eyes | [7] |
| 5. | *Phyllanthus reticulates (Kirganelia reticulate)* | bark | Leafflower(English) Panjuli(Hindi) | Rheumatism, dysentery and veneral diseases, also used as ailments including small pox, syphilis, asthma, diarrhea, bleeding from gums | [8-9] |
| 6. | *Tragia cannabina* | whole plant | Kaanchori(Tamil) | Anti-inflammatory | [10] |
| 7. | *Codiaeum variegatum* (L.) Blume | Root | garden croton(English) | Decoction is taken to treat gastric ulcers | [11] |
| 8. | *Codiaeum variegatum* (L.) Blume | leaves | garden croton(English) | Antibacterial and antiamoebic properties | [11] |
| 9. | *Euphorbia heterophylla* | Vegetable and latex | Milkweed(English) | Insect bites | [12] |
| 10. | *Euphorbia heterophylla* | | Milkweed | Treatment for erysipelas, Treatment for cough, | [13-14] |

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| | | | (English) | bronchial paroxymal asthma, hay fever, catarrh. | |
| 11. | *Euphorbia hirta* | Different parts | hairy spurge (English) | Gonorrhea, tuberculosis, cough, rheumatic pains, stomach trouble, corneal opacity, wounds and insect bites, antimicrobial and anti-inflammatory activities | [15-17] |
| 12. | *Croton argyratus* | Whole plant | Garden croton (English) | Anti-inflammatory, anticancer, cytotoxicity | [18-20] |
| 13. | *Physalis minima* | Whole plant | Rasbhari (Hindi) | To cure Jaundice | [21] |
| 14. | *Croton tiglium* | Whole plant | Garden croton (English) | Pain reliever and Dry cough cure liver diseases, sprains, snake bites, and as a purgative for the first as well as insanity, convulsions, asthma, tumors, rheumatism | [21 &169] |
| 15. | *Hymenocardia ulmoides oliv.* | leaf | small red-heart | Diabetes, hypertension and is used as per to treat neuralgia, dysuria and asthma. It is also taken orally as a mixture with Nauclea latifolia to treat angina | [22-23] |
| 16. | *Euphorbia wallichii* | root | Wallich Spurge (English) | *In vitro* phytotoxicity, cytotoxicity and antibacterial activity | [24] |
| 17. | *Jatropha multifida* | Whole plant | Coral Bush (English) | Herbal tea to treat microbial infections | [25] |
| 18. | *Acalypha fruticosa* forssk | Whole plant | Copper leaf (English) | Dyspepsia, stomachache, skin diseases, wounds and poisonous bites. | [26-32] |
| 19. | *Acalypha fruticosa* forssk | leaf and stem | Copper leaf (English) | Skin diseases, malaria and wound | [33] |
| 20. | *Acalypha fruticosa* forssk | Whole plant | Copper leaf (English) | Antidiarrhoeal , antioxidant, anti-inflammatory, anticancer, antiplasmodial, wound healing and cytotoxic properties. | [34-39] |
| 21. | *Phyllanthus debilis* Klein.ex.willd | Whole plant | Niruri (Hindi) | Hepatoprotective | [40] |
| 22. | *Bridelia micrantha* Hochst., Baill. | stem bark | Coast gold (English) | Intestinal parasites, gastritis, salmonellosis and gastro-enteritis, stomach problems, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), infertility, neurosis and psychosis | [41-42] |
| 23. | *Hymenocardia acida,* Tul | leaf | Hymenocard-ia (English) | Decoction used as an eye wash | [43] |
| 24. | *Hymenocardia acida,* Tul | Leaf, stem bark. Root bark | Hymenocard-ia (English) | Headache, chest pain, rheumatic pain, toothache, ear pain, migraine and sickle cell | [44] |
| 25. | *Acalypha hispida* | Whole plant | Cat's Tail (English) | Laxative, diuretic, expectorant in asthma, in the treatment of leprosy and kidney ailments. | [45] |
| 26. | *Phyllanthus amarus* Schum | Whole plant | Jar-Amla (Hindi) | Hepatoprotective , anti-diabetic, antihypertensive, analgesic, anti inflammatory and antimicrobial properties. stomach disorders, skin diseases and cold, anti-diarrhea effect, anti- viral activity against hepatitis B, anti-carcinogenic, anti- nociceptive and anti- inflammatory activities, antidiabetic and antilipidemicpotentials | [46-52] |
| 27. | *Euphorbia scarlatica* (L) O. Ktze | Stem | Spurge (English) | Stomach ache, common cold, TB | [53] |
| 28. | *Securinega virosa* | Whole plant | Dhani (Hindi) | Mental illness, epilepsy | [54] |
| 29. | *Ricinus* | Whole | Castor oil plant | Inflammation and liver disorders, Hypoglycemic, | [55-57] |

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| | *communis L.* | plant | (English) | Laxative . | |
| 30. | *Bridelia ferruginea* Benth. | Stem bark | Kirni | Antibiotic, skin infection, diuretic, febrifuge and urethral discharge. | [58] |
| 31. | *Bidens pilosa* | Whole plant | Spanish Needle (English) | Poultice topically applied to sores, for ear aches and intestinal infections. Infusion taken for coughs and colics. Healing of peptic ulcers. Hot infusion of leaves for conjunctivitis. | [59] |
| 32. | *Euphorbia thymifolia linn* | Whole plant | Chicken weed (English) | Laxative, diuretic, antihelmintics, constipation, skin diseases, bitter and antiviral anti-viral against simplex virus-2 | [60&168] |
| 33. | *Euphorbia tirucalli* | Whole plant | pencil plant | Molluscicidal activity, antibacterial activity, antiherpetic activity, anti-mutagenic warts, cancer, gonorrhea, arthritis, asthma, cough, earache, neuralgia, rheumatism, toothache, excrescences, tumours | [61-65 & 164-166] |
| 34. | *Phyllanthus hookeri* | Whole plant | Leafflower (English) | Antidiabetic, spasmatic, wound, fever, inflammation, antibacterial and snake bite | [66] |
| 35. | *Phyllanthus kozhikodianus* | Whole plant | Leafflower (English) | Anticonvulascent, Antidysentry, jaundice, ulcer, itching, anti microbial | [66] |
| 36. | *Phyllanthus maderaspatensis* | Whole plant | Hajarmani (Hindi) | Anti – edematic, anti dysentery, Immunomodulatory, fever, ulcer, burn, jaundice, cold, anti microbial. | [66] |
| 37. | *Phyllanthus nozeranii* | Whole plant | Leafflower (English) | Anti viral, spasmatic, piles, anti bacterial, headache, boils, indigestion | [66] |
| 38. | *Jatropha gossypifolia* Linn. | leaf | Lapalapa | Bathing wounds, sores, sprains, rash | [67-69] |
| 39. | *Jatropha gossypifolia* Linn. | stem sap | Lapalapa | Stops bleeding and itching of cuts and scratches | [68 & 70] |
| 40. | *Alchornea laxiflora* | Whole plant | Lowveld bead-string (English) | Inflammatory and infectious diseases | [71] |
| 41. | *Emblica officinalis* Gaerth | Fruits | Amla (Hindi) | Acrid, cooling, refrigerant diuretic, used in diarrhoea, dysentery, anaemia, jaundice and cough | [72] |
| 42. | Cnidoscolus aconitifolius | Whole plant | Tree Spinach (Hindi) | Strengthen fingernails and darken gray hair, to cure for alcoholism, insomnia, gout, scorpion stings, brain and vision improvement | [73-74] |
| 43. | *Phyllanthus fraternus* Webster | Whole plant | gulf leaf- flower (Hindi) | Blennorrhagia, colic, diabetes, dysentery, fever, flu, tumors, jaundice, vaginitis, and dyspepsia, aperitif, carminative, digestive, laxative, stomachic, tonic, and vermifuge | [75] |
| 44. | *Croton zambesicus* Muell Arg. | leaf | Garden croton (Hindi) | Antihypertensive | [76] |
| 45. | Euphorbia Ligularia. Roxb. | Whole plant | Spurge (Hindi) | Antimicrobial | [77] |
| 46. | *Alchornea cordifolia* (Schum. & Thonn.) Muel. Arg. | Whole plant | Christmas bush (English) | Venereal diseases, conjunctivitis, dermatoses, stomach ulcers, bronchitis, cough, toothache, treatment of urinary tract infections, infected wounds, diarrhoea, cough, dental caries, chest pain and anaemia, diarrhoea and piles, gonorrhoea, yaws, rheumatic pain and cough | [78-85] |
| 47. | *Croton bonplandianum* | Leaves | Croton (English) | High blood pressure, for the treatment of skin diseases and cut, wounds, antiseptic and antidote | [86-88] |
| 48. | *Antidesma venosum tul.* | Whole plant | Tassel berry (English) | Wound dressing and macerate of root and bark used to wash syphilitic and gonorrheal eruptions, leafy sap is taken with other medicinal plant for diarrhea and amoebic dysentery | [89] |
| 49. | *Euphorbia balsamifera* | leaves | Spurge | Antimicrobial | [90] |

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| | parts | stem and roots | (English) | | |
| 50. | *Euphorbia neriifolia* Linn. | leaves | Spurge (English) | Aphrodisiac, diuretic and also used in the treatment of bronchitis, bleeding piles and in ano-rectal fistula | [91] |
| 51. | *Euphorbia neriifolia* Linn. | Whole plant | Spurge (English) | Abdominal troubles, bronchitis, tumors, leucoderma, piles, inflammation, enlargement of spleen, anemia, ulcers, fever and in chronic respiratory troubles | [92] |
| 52. | *Euphorbia neriifolia* Linn. | latex | Spurge (English) | Wound healing | [93] |
| 53. | *Acalypha indica Linn* | kucing galak | Khokali (Hindi) | Diuretic, antihelmintic and for respiratory problems such as bronchitis, asthma and pneumonia | [94] |
| 54. | *Bridelia retusa* Spreng. | Whole plant | Kaji (Hindi) | Rheumatism, urinary infection, promote antifertility and wound healing, leaves and fruits are used as stomachic, anti inflammatory and antifungal | [95-100] |
| 55. | *Baliospermum montanum* (Willd.) | Whole plant | Danti (Hindi) | Headace and respiratory tract, cure wounds and ulcer | [101, 102] |
| 56. | *Baliospermum montanum* (Willd.) | root | Danti (Hindi) | Heapatoprotective and analgesic activity | [103] |
| 57. | *Euphorbia royleana* | Whole plant | Spurge (English) | Anti-inflammatory | [104] |
| 58. | *Cnidosculus chayamansa* Mc Vaugh | Leaves infusion | Chayamansa (Hindi) | Hypoglycemic activity | [105-109] |
| 59. | *Croton draco* Schltdl. | Cortex infusion, latex | Croton (English) | Hypoglycemic activity | [105-109] |
| 60. | *Croton torreyanus* M¨ull Arg. | Whole plant | Croton (English) | Hypoglycemic activity | [105-109] |
| 61. | *Euphorbia maculata* L. | Cortex infusion, latex | Spurge (English) | Hypoglycemic activity cholera, diarrhea and dysentery | [105-109 & 167 ] |
| 62. | *Euphorbia prostrata* Aiton | Leaves infusion | Spurge (English) | Hypoglycemic activity | [105-109] |
| 63. | *Jatropha dioica* Cerv. | Root infusion | Sangre de grado (English) | Hypoglycemic activity | [105-109] |
| 64. | *Jatropha elbae* J. Jim´enez Ram. | Bark infusion | Sangre de grado (English) | Hypoglycemic activity | [105-109] |
| 65. | *Croton cajucara Benth.* | Whole plant | Croton (English) | Hypoglycemic activity | [110] |
| 66. | *Maprounea africana* Muel | Whole plant | Magic nut (English) | Hypoglycemic activity | [111] |
| 67. | *Phyllanthus sellowianus* Mull.Arg. | Whole plant | | Hypoglycemic activity | [112] |
| 68. | *Jatropha curcas* (Linn) | Whole plant | Physic nut (English) | Skin infections, gonorrhoea, and jaundice and fever , mouth infections, guinea worm sores and joint rheumatism | [7 & 113-115] |
| 69. | *Acalypha wilkesiana* (Mull. Arg.) | leaf | Copper leaf (English) | Antimycotic and antibacterial | [116] |
| 70. | *Acalypha monostachya* Cav. | Whole plant | Round copper leaf (English) | Illnesses like skin eruptions, wound healing and diarrhea | [117] |
| 71. | *Aporosa lindleyana* | Whole | Lindley's Aporosa | Antioxidant activity, antihyperglycemic effect | [118,119] |

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| | | plant | (English) | | |
| 72. | *Putranjiva roxburghii* | Whole plant | Putranjiva (Hindi) | Azoospermia, diuretic, catrrah, opthalmopathy and constipation, anti-inflammatory, analgesic and antipyretic | [120-121] |
| 73. | *Excoecaria agallocha* L. | Whole plant | Blinding tree (English) | Treat sores and stings from marine creatures, and ulcers, as a purgative and an emetic, and the smoke of its bark has been used to treat leprosy | [122] |
| 74. | *Excoecaria agallocha* L. | bark | Blinding tree (English) | Oil has also been found effective against rheumatism, leprosy and paralysis | [122] |
| 75. | *Excoecaria agallocha* L. | Whole plant | Blinding tree (English) | Potential anti-HIV, anticancer, antibacterial and antiviral properties | [123] |
| 76. | *Acalypha torta* | Whole plant | Three seeded mercury (English) | Neonatal jaundice | [124-127] |
| 77. | *Tragia involucrate* Linn. | Whole plant | Indian Stinging-nettle (English) | Pruritic skin eruptions, venereal diseases, haeorrhoids, gastropathy, guinea worms, blood impurities, dipsia, vomiting giddiness,vitiated conditions of pitta, melalgia and brachialgia | [128] |
| 78. | *Tragia involucrate* Linn. | root | Indian Stinging-nettle (English) | Diaphoretic, fever and infection of skin, cold during fever, also for pains in the legs and arms, external application in leprosy | [7,129, 130] |
| 79. | *Croton celtidifolius* Baill. | bark and leaf | Croton (English) | Inflammatory diseases, leukemia, ulcer and rheumatism | [131] |
| 80. | *Croton eluteria* Bennett. | Whole plant | Croton (English) | Balsamic, digestive, hypotensive, narcotic, stomachic and tonic, and used to treat bronchitis, diarrhea and dysentery | [132] |
| 81. | *Croton malambo* Karst | bark | Croton (English) | Diabetes, diarrhea, rheumatism, gastric ulcer and as anti-inflammatory and analgesic | [133] |
| 82. | *Croton nepetaefolius* Baill. | Whole plant | Croton (English) | Stomachic, carminative and for the treatment of intestinal colic | [134] |
| 83. | *Croton nepetaefolius* Baill. | bark and leaves | Croton (English) | Antispasmodic properties and to relieve flatulence and to increase appetite | [135] |
| 84. | *Croton palanostigma* Klotzsch | latex | Croton (English) | Wound-healer | [136] |
| 85. | *Croton palanostigma* Klotzsch | Whole plant | Croton (English) | Treating gastric ulcer and intestinal inflammation | [137] |
| 86. | *Croton schiedeanus* Schlecht. | Whole plant | Croton (English) | Hypertension | [138-139] |
| 87. | *Croton urucurana* Baill. | Whole plant | Croton (English) | Analgesic and anti-inflammatory effects, treat wound infection, to accelerate wound-healing, to treat rheumatism, cancer and other illnesses. | [140-142] |
| 88. | *Croton zehntneri* Pax. et Hoffm. | Whole plant | Croton (English) | Sedative, appetite stimulating, antianorexigen and for the relief of gastrointestinal disturbances | [143-144] |
| 89. | *Croton arboreous* Millsp. | Whole plant | Croton (English) | Auxiliary anti-inflammatory in respiratory ailments | [145] |
| 90. | *Croton californicus* Müll. Arg. | Whole plant | Croton (English) | Pain reliever for rheumatism | [146] |
| 91. | *Croton draco* Cham. & Schltdl. | Whole plant | Croton (English) | Wound healing for cuts, open sores, herpes, anti-septic after tooth extraction and for oral sores | [147] |
| 92. | *Croton macrostachys* Hochst. ex Rich. | Whole plant | Croton (English) | Antidiabetic | [148] |
| 93. | *Croton zambesicus* Müll. | Whole | Croton (English) | Anti-hypertensive, Anti-microbial (urinary infections) | [149-150] |

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| | Arg. | plant | | and to treat malarialinked Fever | |
| 94. | *Croton sublyratus* Kurz | Whole plant | Croton (English) | Anti-helminthic, treat dermatological problems | [151-152] |
| 95. | *Croton tonkinensis* Gagnep., | leaves | Croton (English) | stomach-ache, burns, abscesses, impetigo, dyspepsia and gastric/duodenal ulcers, urticaria, leprosy and psoriasis | [153] |
| 96. | *Euphorbia guyoniana* Boiss. and Reut. | Whole plant | Spurge (English) | Anti- bacterial | [154] |
| 97. | *Euphorbia ebracteolata* Hayata | Whole plant | Spurge (English) | Anti- bacterial | [155] |
| 98. | *Euphorbia segetalis* L. | Whole plant | Spurge (English) | Anti- bacterial | [156] |
| 99. | *Euphorbia hyberna* L. | Whole plant | Spurge (English) | Anti-viral | [157] |
| 100 | *Euphorbia kansui* | Whole plant | Spurge (English) | Anti-viral | [158] |
| 101 | *Macaranga monandra* Müll.Arg. | Whole plant | - | Anti-fungal | [159] |
| 102 | *Euphorbia helioscopia* | Whole plant | Spurge (English) | Nematicidal | [160] |
| 103 | *Jatropha elliptica* Müll. Arg. | Whole plant | Parasol Leaf Tree (English) | Moluscicidal | [161] |
| 104 | *Jatropha isabellii* | Whole plant | - | Antileishmanial | [162] |
| 105 | *Jatropha grossidentata* | Whole plant | - | Antileishmanial | [162-163] |
| 106 | *Euphorbia ptercineura* | Whole plant | - | Asthma and cough; | [170] |
| 107 | *Croton peraeruginosus* | Whole plant | - | Pimples | [170] |
| 108 | *Phyllanthus micrandrus* Müll. Arg. | Whole plant | - | Wounds, inflammations and infections | [170] |

## Conclusion

This review has revealed a rich variety of potentially medicinal properties of Euphorbiaceae. The diverse medicinal properties are associated with the adaptation to different geographical location and condition. A detailed investigation of the mechanism will further authenticate the use of these plants as medicines.

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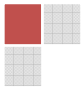

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